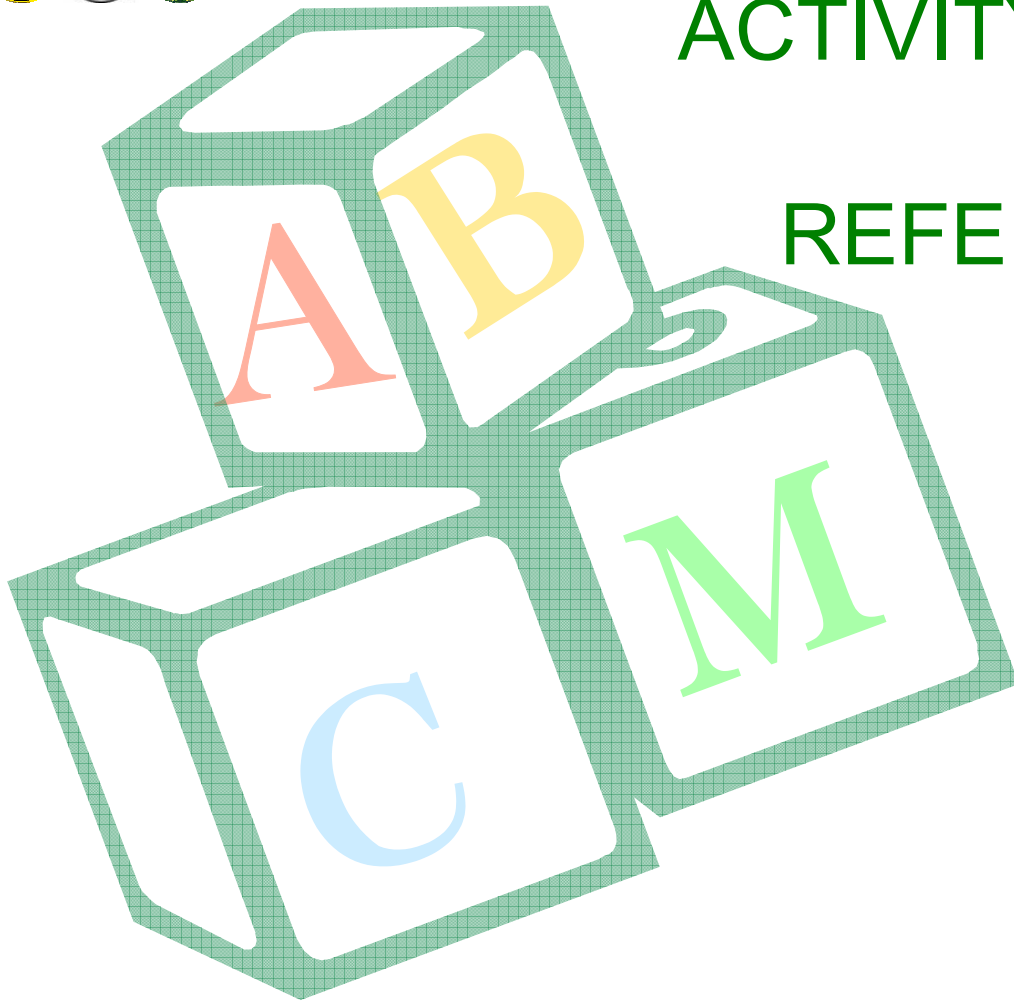# ACTIVITY BASED COSTING (ABC)
REFERENCE MANUAL

Introduction

The purpose of this guide is to outline the various dimensions of Activity Based Costing (ABC) model building and to lay the framework for tailoring our ABC models into robust tools to facilitate decision making and continuous improvement.

2004-2005 Accomplishments & Goals

✓ *Assigned ABC/M model building, sustaining & improvement to an ABC team*

✓ *ABC models built identifying the SSPs*

✓ *Full model automation – sustainment/maintenance*

✓ *Directorate ABC liaisons/POCs appointed*

✓ *DA level ABC/M training provided to GC/Directors*

✓ *Model tests and refinement – model readied for full utilization FY 2005*

✓ *Preliminary reports generation*

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What steps are ongoing?

- Continuously refine and add dimension to model
- Dimension:
    - Refine/Finalize Activities Aligned with the SSPs
    - Review Cost Drivers
    - Align Cost Centers and Resources
    - Add Performance Measures
    - Expand Cost Objects
    - Add Attributes
    - Generate/Refine Reports
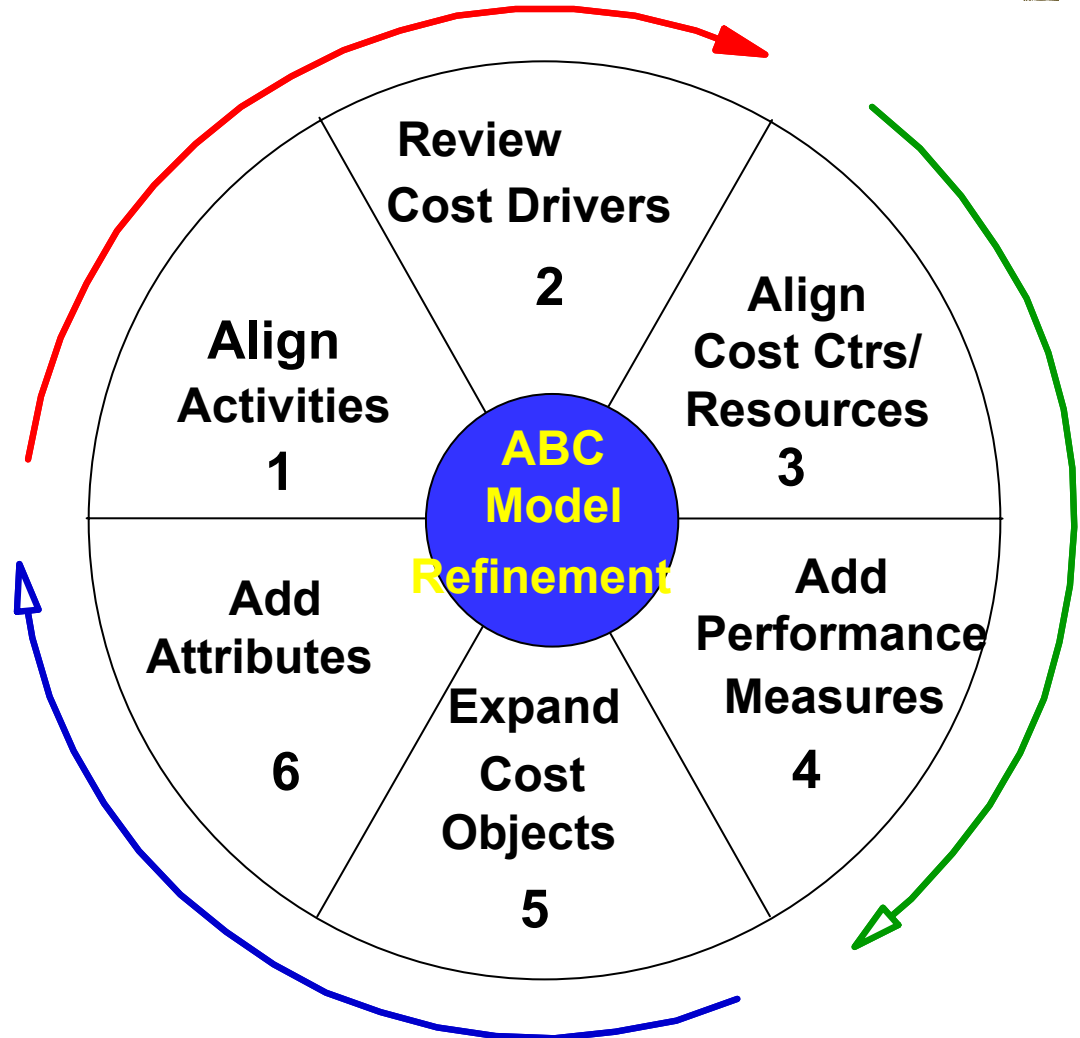   - Transition into a culture of Activity Based Management

Steps to refine our model.
The steps do not necessarily have to be done in this order - numbers are for reference only.

When will ABC/M be complete?
 - Never - remember this is continuous improvement
How do you know if your model is a good tool?
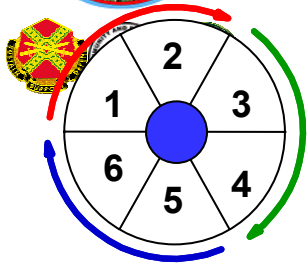-When it can answer your management questions

ABC Model Refinement

- Review Cost Drivers — 2
- Align Cost Ctrs/ Resources — 3
- Add Performance Measures — 4
- Expand Cost Objects — 5
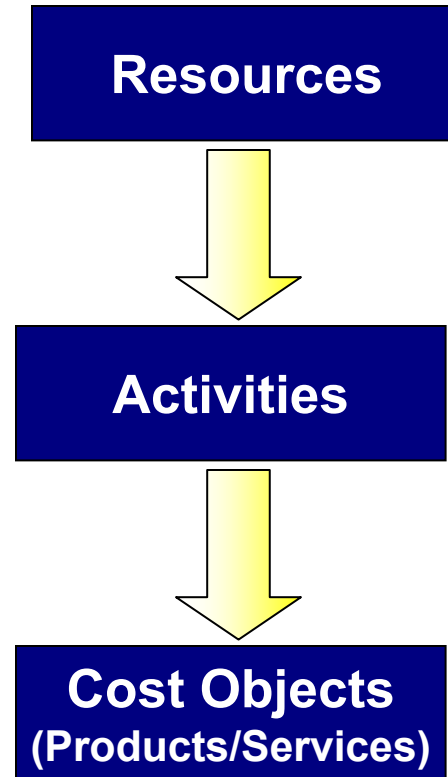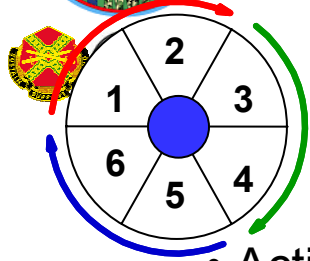- Add Attributes — 6
- Align Activities — 1

1. Align Activities to SSPs

ABC operates on a simple concept of two-stage assignment of costs

- Resources are consumed by activities

- Activities are consumed by products/services to satisfy customer demands

Resources

↓

Activities

↓

Cost Objects
(Products/Services)

1. Refine Your Activities (Cont.)

Knowing more about activities as related to ABC will help determine your activities.

- Activities. A process, function, or task that has recognized results. Activities use up assigned resources to produce products and services.

- Understanding activities is key to continuous improvements since *ACTIVITIES* are the building blocks of business processes.

- PRIMARY ACTIVITIES – directly support the organization's mission
- SECONDARY ACTIVITIES – support primary activities
- ACTIVITY – will result in an output (service or product)

> TIP: More is Not Better! Do not think more activities make a better ABM system. Most companies (in our case – Garrisons) can effectively describe themselves with 200-250 activities.

1. Refine Your Activities (Cont.)

The level at which you build model is key to results and the value-added you will get from your modeling efforts. See model hierarchy example below.

ABC HIERARCHY	DEFINITION	EXAMPLE	MODEL RESULTS
FUNCTIONS/ Organizational Structure	A collection of people who share a common responsibility	DOL DPW	Building model at function level too general to achieve results.
COST CENTERS	One portion of a function. Contains people/machines sharing a common mission.	Transportation Division Army Family Housing Div	
BUSINESS PROCESSES	Transcend Dept lines. Group of related activities operating under a set of procedures.	Directorate IMO Supply	
ACTIVITIES	What an organization does. (Verb+Noun)	Provides Transportation Services Monitors AFH Contract	Activities linked to a business process is KEY to results
TASKS	Steps necessary to perform an activity.	Book transportation requests. Prepare monthly COR report.	Information Over-load Model too tedious to maintain – value added is questionable

1. Refine Your Activities (Cont.)

Rule of thumb for USAG-HI's Garrison model activities

- Activity baseline is ABS – 95 Services
- Common Levels of Support (CLS) **Service Support Programs** (SSP's)
- Further breakdown - Key Activities – should result in measurable output
- Criteria to determine Key activities:
    - Activities where Garrison interacts with customers
    - High cost activities
    - Core & sustaining activities - required by mission
    - Support strategic vision, mission, goals
    - Activities with potential for contracting out/privatization
    - Activities where a "problem" is perceived

Rule of thumb in defining activities

Is the activity significant? (Is it greater than 5% of the total resource)

Yes → **Is the activity too large? (Is it greater than 40% of the total Resource)**

Yes → **Decompose activity**

No → **Activity definition accepted**

No → **Is the activity important?**

Yes → **Activity definition accepted**

No → **Combine with another activity or "other activities"**

Business Rule:
Keep activities at a "key" level – drill down when problem areas are identified

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1. Refine Your Activities (Cont.)

Diagram below demonstrates a "key" activity for say a GC Administrative Office.

Identifies the "activity" from the supporting tasks

ACTIVITY: CONTROL CORRESPONDENCE

Incoming Letter → Receive Correspondence → Assign to Action Officer → Coordinate Response Preparation → Prepare Response → Coordinate Approvals → Incorporate Changes → Sign Response → Distribute Response → Outgoing Correspondence
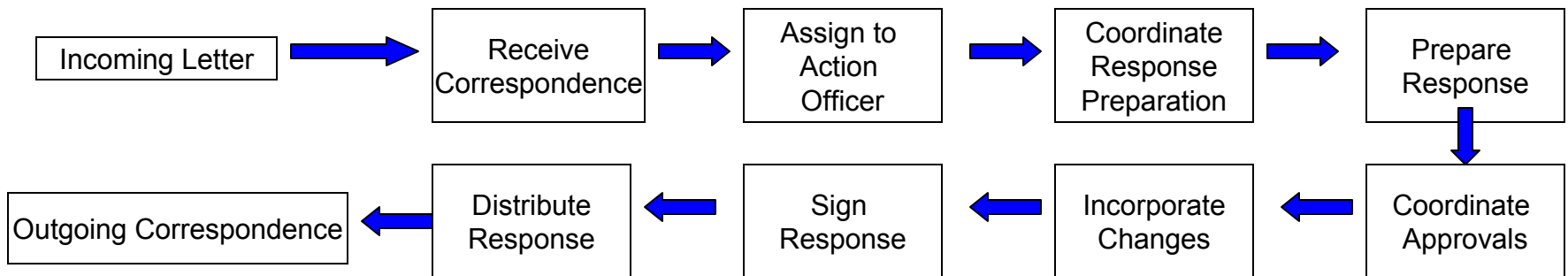
1. Refine Your Activities (Cont.)

Samples of an Activity with a "measurable" Output

ACTIVITY	ACTIVITY OUTPUT	MEASURE OF ACTIVITY OUTPUT
Process customer work orders	A completed work order	Number of work orders processed within target
Conduct Inventory	Completed inventory	Number of inventory items counted.
Conduct internal audits	A completed audit	Number of audits completed on schedule
Provide emergency response service	Emergency response call completed	Number of emergency response calls
Setup PCs	An operational PC	Number of PCs setup

Garrison on-hand Resources to assist with identifying activities:
- Installation Status Report Services/Service Based Costing definitions
- CLS SSPs
- IMA Mission and Function Manual (10-XX (in draft) – to be published 05)
- IMA O&Os

1. Refine Your Activities (Cont.)

Once Garrison activities are refined/finalized the next
step is the Activity Dictionary

A sample activity in a completed dictionary might look like this:

Activity	Maintain payroll master file
SBC service or business process	Administration of payroll/human resources
Activity number	1.0
Activity description	Maintain current status of all employee master files
Activity tasks	Receive changes, enter changes, edit changes, and run file
Activity Output	Updated payroll master file
Activity output measure	Number of employees files maintained
Performance Measurements	Quality: 1st pass yield on changes Cycle Time: Time per change Request Productivity: Cost per employee file updated or # of files Per day.
Cost Drivers	(1) Employee Turnover (2) Frequency of changes/update

* * Maintains continuity and consistency of reporting* *

2. Review Activity/Cost Drivers

Activity Driver. Used to assign activity costs to cost objects

Activity Driver Sample

MATERIAL RELATED ACTIVITY	ASSUMPTION	ACTIVITY DRIVER(S)
Receive Raw Materials Inspect Raw Materials Store Parts	Each part # represents a received, inspected, stored part	# of part numbers is a viable activity driver to trace each activity cost to a cost object (i.e., homogeneous) *

Tips for identifying activity drivers
- put the words "Number of" in front of driver
- driver should correlate with actual consumption of the activity
- Minimize # of unique drivers to cut down on complexity of model
- drivers should encourage improvement
- drivers should be already available or easy to collect

• Homogeneous. The output takes approximately the same amount of time or resources each time activity output is produced.   If there is variability in time or resources an equivalent driver should be found.

USAG-HI Resources to identify Activity Drivers
- Service Based Costing pacing measures
- ASIP – population
- Performance Metrics from ISR Services
- Internal Review and analysis

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2. Review Activity/Cost Drivers

<u>Activity drivers</u>. The output measure or the measure of activity workload.

INPUT

INPUT ⇒ ACTIVITY ⇒ OUTPUT

Each activity will have an input. An input is the factor that "causes" the activity to occur.

OUTPUT

INPUT ⇒ ACTIVITY ⇒ OUTPUT

Once the input causes the activity to occur, the activity begins to consume resources to produce an output. The output represents the process of performing the activity. The output Is what the internal/external customer(s) receive

The addition of activity drivers provide cost per unit costs.

Establishing cost per unit targets in model – gives info on Where you stand against an improvement target.

2. Review Activity/Cost Drivers

The examples below show (on the first half of the table) Activity Drivers that already exist in Service Based Costing. The bottom half of table show examples of potential activity drivers we may consider useful.

SBC Service	Existing Activity Driver	SBC Service	Existing Activity Driver
Military Personnel Svcs	Total # of Personnel files maintained	Substance Abuse	# of Urinalysis samples taken
Child and Youth Programs	Total # of children enrolled in CDC	Automation	Total # of workstations supported
Ammunition Supply	Total # of customer transactions processed.	Material Support Maintenance	Total # of Maintenance Work Orders processed
Support Agreement Management	# of ISAs updated	Administrative and Civil Law	# of claims processed
	POTENTIAL ACTIVITY DRIVERS		
	No. of Sq Feet Supported		No. **of** work orders completed
	No. of Clients Served		No. of requests processed
	No. of Participants Served		FTEs expended

Tip: Add "targets" for further analytical dimension.

2. Add Activity/Cost Drivers (Cont.)

COST DRIVER. Is any factor that causes a change in the cost of an activity.   An activity typically has multiple cost drivers.

Cost Driver Sample

Activity	Cost Drivers
Assemble Product	- # of discrete parts - Quality of Components - Product Design
Review an ISA	# of services provided Customer (external Army/Army) New or Existing ISA

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3. Align Cost Centers/Resources

COST CENTER DEFINITION: *represents one portion of a function. A cost center typically contains people and/or equipment that share a common purpose or mission. Typically, an organization has several cost centers each with a specific responsibility or specialty.*

USAG-HI'S COST CENTER HIERARCHY

Hierarchy	Name	Reference No
ORG	DOIM	DOIM
DIV	S1	DOIM_S1
BRANCH	ASC	DOIM_S1_ASC
SECTION	Mail & Distro	DOIM_S1_ASC_Mail & Distro
UNIT		
COST1	Labor (Civ, Mil, NAF)	DOIM_S1_ASC_Mail & Distro_Labor
COST2	Nonlabor	DOIM_S1_ASC_Mail & Distro_Nonlabor

In this sample, the Cost Center is Mail & Distro Center, ASC Branch, S1 Division, DOIM

They have two **cost categories:**
Labor
Non-Labor

USAG-HI Cost Center Business Rule:

• *Each cost center must have at least one Accounting Processing Code (APC)*

• *An APC cannot be shared between Cost Centers*

Using the DOIM sample from previous chart, sample APCs are:

APC	HIERARCHY	COST CENTER	CODE	ACTIVED
Parent	ORG	DOIM	**DOIM_**	Yes
Parent	DIV	S1	DOIM_S1	Yes
PNAA	BRANCH	Admin Svces Br	DOIM_ASC	Yes
No APC	SECTION	Mail & Distro	DOIM_ASC_Mail & Distro	No

Definition of APC:

A four digit code, identifies specific elements of the accounting classification and may be used as a shortcut to entering numerous elements into the accounting system for each transaction. Assigned locally by the budget office.

Directorate's Role in Cost Center Alignment

- Validate APCs for each Cost Center
    - APC aligns with activities prescribed for cost center?
    - APCs structure within cost center easy to follow by cost center POC assigning activities
    - Are personnel assigned to the APC correct?
- Need to realign create APCs
    - Use common sense. (e.g., if supply is a centralized activity no need to have an APC for supply for each cost center. Pro-rate cost of supplies by using a factor such as # of personnel in Division.)
    - Coordinate realignment/creation of APCs first with ABC/M analyst to ensure you maintain the integrity of your portion of the model and second your budget analyst.
- Appoint knowledgeable Cost Center POCs and backups for each Cost Center
    - ensure cost center POC understands IMPORTANCE of their role
    - ensure cost center POC logs on and allocates costs to DCT from the 16th to end month
    - ensure backups are engaged when primary is out of loop from 16 to end of month

3. Add Performance Measures

- **Performance measure**. indicators of the work performed and the results achieved in an an activity, process, or organizational unit.

- An **ABM system** focuses on measuring the performance of activities by assessing the quality, cycle time, productivity, and customer satisfaction.

- Each of the elements above have limited value when viewed independently. Each measure must be considered in tandem to fully measure performance. (e.g., Productivity improvements would not be meaningful if cycle times increased or customer service levels declined.)

TIP. Knowing the total cost of an activity is insufficient to measure activity performance. Therefore, addition of performance measures add a new dimension to your ABM System.

3. Add Performance Measures

Criteria for a good Performance Measure

PRODUCTIVITY: A measure of efficiency (calculation: resources consumed by an activity / activity driver or output). Expressed in monitory terms, productivity improves when the cost per unit of output declines. Productivity links the physical output of an activity to its cost.

QUALITY: Quality simply means conformance to specification. Quality is the clearest example of why the 4 elements of an activity must be analyzed in tandem. Poor conformance directly affect productivity. Nonconformance also lengthens cycle time. Quality measurements are one of the most useful information outputs for management to achieve a goal of providing the lowest product/service cost while at the same time meeting customer satisfaction.

CYCLE TIME: Total elapsed time it takes to complete an activity. Cycle times can be expressed in hours, days, weeks, etc.

CUSTOMER SATISFACTION: A key performance measure is to quantify customer satisfaction as expressed by the customer. Unfortunately, performance systems today are primarily "inwardly" focused (I.e., we compare ourselves with ourselves). These inward comparisons don't tell us if our improvements are "good." (I.e., 5% better than poor is still poor.) To be effective we must embrace benchmarking/best practices.

Resources For Identifying Performance Measures:
- *Installation Status Report (ISR) Services*
- *Performance Management Review (PMR)*
- *Common Levels of Support (CLS)*
- *Internal Review and Analysis Programs*
- *Army Regulations*

Tip. Targets add further dimension to performance measures.

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4. Expand Cost Objects

<u>COST OBJECT</u>: any customer, product, service, contract, project, or other work unit for which a separate cost measurement is desired

The ABS cost objects will help us answer the question: How much does it cost to perform each ABS Service and the activities within those services.

TO ENSURE OUR MODEL IS A "ROBUST AND POWERFUL" TOOL WE NEED TO ENHANCE COST OBJECTS. BY DOING SO WE CAN ANSWER MORE AND MORE QUESTIONS ABOUT OUR GARRISON AND WHAT ARE OUR BEST TARGETS FOR IMPROVEMENT.

TIP. *We are not limited when expanding cost objects. As long as there are unanswered questions – cost objects can be added to answer them!*

4. Expand Cost Objects

Preliminary list of possible Garrison Cost Objects

Cost Object	Sample Questions Cost Object Can Answer?
Customers	What does it cost to support each customer (internal/external)? A group of customers (Army/Non Army)?
Installations	What does it cost to provide DPW support to PTA?
Special Events/Exercises	What did it cost to execute the deployment? What did it cost to execute a special support exercise?
Facilities	How much time/cost is being spent to support temporary facilities? Airfields? Tenant facilities?
Contracts	What is the cost per unit, output, resources for the BAE contract? DPW MEO?

5. Add Attributes.

ATTRIBUTES: *a descriptive label given to activities (e.g., value added or non-value added). Attributes attached to activity costs results in robust ways to understand cost behavior. Attributes quantify different aspects of business processes, and they provide ways on which to focus, prioritize, analyze, and measure.*

One ABC/M author and guru, Gary Cokins, links attributes with "Identifying and measuring the cost of error and waste."

Some ABC/M practitioners believe it is the use of "attributes" that really brings power to ABC/M analysis. Attributes take the ABC/M data an additional step beyond just monetary info by making the data very suggestive in terms of what actions need to be taken. Monetary info alone does not necessarily convey to anybody what to do or how to Improve.

5. Add Attributes

- *The choice of attributes are unlimited*

- *Common ones that might work for the Garrison are listed below:*

Value Added	Non-value Added	Required	Discretionary
Critical	Non-Critical	Strategic	Operational
Primary	Secondary	Must Fund	Not Must Fund
Core	Sustaining	Army	Non-Army
Contracted	In-House	Fixed	Variable

Others:
Customer valued
Cost of Quality
Potential for CA/Privatization

TIP. Garrison approach should be to prioritize those attributes we want to see as a Garrison. Directors can then "personalize" those they need internally.

Once dimension (steps 1 thru 6) is added to model reporting will automatically improve.

Report output organizations can expect through adding model dimension are found on the next few charts.

ACTIVITY	COST	COST DRIVERS	COST/UNIT OF ACTIVITY OUTPUT	TARGET VALUES
Setup/scheduling	$100,000	Complexity of assembly Production estimates	$863 per set up hour	$825 per set up hour
Handling Material	$250,000	Product features Plant Layout Misplaced material	$17.63 per material move	$15.00 per material move
Assembling Components	$50,000	Complexity of assembly Poor component quality	$46.12 per assembly	$35.00 per assembly
Inspecting	$125,000	Poor material quality Poor training	$81.45 per inspection	$70.00 per inspection

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6. IMPROVE/TAILOR REPORTS

Resource Contribution Report to the Cost Object

Cost Object	Ref No.	Module	Actual Cost	Actual % of Contribution
Government	**1**	**C**	**$10,000,000**	**100%**
Salaries & benefits	1	R	$5,900,000	54.63%
Equipment & supplies	2	R	$4,900,000	45.37%
Contract Distributors	**2**	**C**	**$25,200,000**	**100%**
Salaries & benefits	1	R	$14,100,000	55.95%
Equipment & supplies	2	R	$11,100,000	44.05%

6. IMPROVING/TAILORING REPORTS

Contributions Report – Resource Consumption by Activity

ACTIVITY	ACTUAL COST	ACTUAL %	ACTUAL COST/Unit
Fulfilling Warranties	**$6,000,000**		**$1,200**
Actual Output - # of warranties filled	5,000		
Equipment & Supplies	$4,000,000	66.67%	$800
Salaries & Benefits	$2,000,000	33.33%	$400
Total Cost		100%	$1,200
Producing Catalogs	**$6,000,000**		**$60**
Actual Output - # of Catalogs distributed	100,000		
Equipment & Supplies	$4,000,000	66.67%	$40
Salaries & Benefits	$2,000,000	33.33%	$20
Total Cost	$6,000,000	100%	$60
Administering Sales	**$16,000,000**		**$1,000**
Actual Output - # of Catalogs distributed	16,000		
Equipment & Supplies	$10,000,000	62.50%`	$625
Salaries & Benefits	$6,000,000	37.50%	$375
Total Cost	$16,000,000	100%	$1,000.00

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6. IMPROVING/TAILORING REPORTS
Contributions Report – Activity Consumption by Cost Object

ACTIVITY	ACTUAL COST	ACTUAL % OF RESOURCE CONTRIBUTIONS TO ACTIVITY	ACTUAL COST/Unit
Government	$10,800,000		$12,706
Actual Output - # of Customers	850		
Administrative Sales	$4,000,000	37.04%	$4,705.88
Fulfilling Warranties	$2,400,000	22.22%	$2,823.53
Producing Catalogs	$2,400,000	22.22%	$2,823.53
Advertising Products	$2,000,000	18.52%	$2,352.94
Total Cost	$10,800,000	100.00%	$12,705.88
Contract Distributors	$25,200,000		$11,720.93
Actual Output - # of Customers	2,150		
Administrative Sales	$12,000,000	47.62%	$5,581.40
Fulfilling Warranties	$6,000,000	23.81%	$2,790.70
Producing Catalogs	$3,600,000	14.29%	$1,674.42
Advertising Products	$3,600,000	14.29%	$1,674.42
Total Cost	$25,200,000	100.00%	$11,720.93

6. IMPROVING/TAILORING REPORTS

Performance Measurement Report – Activity Module

ACTIVITY	Measure	Actual Cost	Actual Quantity	Performance Measure
Administering Sales		$16,000,000		
Performance Measures:				
TOTAL DRIVER QUANTITY	No. of Sales		16,000	$1,000.00
Fulfilling Warranties		$6,000,000		
Performance Measures:				
TOTAL DRIVER QUANTITY	No. of Warranties filled		5,000	$1,200.00
Producing Catalogs		$6,000,000		
Performance Measures:				
TOTAL DRIVER QUANTITY	No. of catalogs distributed		100,000	$60.00

6. IMPROVING/TAILORING REPORTS

Attribute Costs Report

Name	Ref No.	Actual Cost
ATTRIBUTE: CRITICAL		
Administering Sales	9	$16,000,000
Advertising Products	10	$8,000,000
Producing Catalogs	7	$6,000,000
TOTAL ATTRIBUTE COST		$30,000,000
ATTRIBUTE: DEFERRABLE		
Fulfilling Warranties	6	$6,000,000
TOTAL ATTRIBUTE COST		$6,000.000

Activity Contributions Report – to the Cost Object

ACTIVITY	ACTUAL COST	ACTUAL % OF RESOURCE CONTRIBUTIONS TO ACTIVITY	ACTUAL COST/Unit
Fort Lewis	$10,800,000		$27,000
Actual Output – (Miles KM)	400		
Paving Roads	$4,000,000	37.04%	$10,000
Vehicle Maintenance & Repair	$3,200,000	29.63%	$8,000
Inspecting & repairing roads	$2,000,000	18.52%	$5,000
Managing Human Resources	$1,600,000	14.81%	$4,000
Total Cost	$10,800,000	100.00%	$27,000
Schofield Barracks	$25,200,000		
Actual Output – (Miles KM)	1,200		
Paving Roads	$12,000,000	47.62%	$10,000
Vehicle Maintenance & Repair	$6,000,000	23.81%	$5,000
Inspecting & repairing roads	$4,800,000	19.05%	$4,000
Managing Human Resources	$2,400,000	9.52%	$2,000
Total Cost	$25,200,000	100.00%	$21,000.00

6. IMPROVING/TAILORING REPORTS

Performance Measurement Report – Activity Module

ACTIVITY	Measure	Actual Cost	Actual Quantity	Performance Measure
Vehicle Maintenance & repairs		$8,000,000		
Performance Measures:				
TOTAL DRIVER QUANTITY	No. of Vehicles Repaired		500	$16,000.00
Inspecting & Repairing Roads		$8,000,000		
Performance Measures:				
TOTAL DRIVER QUANTITY	No. of Miles (KM)		16,000	$5,000.00
Managing Human Resources		$4,000,000		
Performance Measures:				
TOTAL DRIVER QUANTITY	No. Personnel action forms		10,000	$400.00

In Summary

"There is nothing so wasteful as doing with great efficiency that which does not have to be done at all."

Tom Pryor
ICSMS, Inc.

GLOSSARY

Cost Object. Any customer, product, service, contract, project, or other work unit for which a separate cost measurement is desired.

Cost of Quality. All the resources expended for appraisal costs, prevention costs, and both internal and external failure costs of activities and cost objects.

Non-value-added Activity. An activity that is considered not to contribute to customer value or to the organization's needs. The designation non-value-added reflects a belief that the activity can be redesigned, reduced, or eliminated without reducing the quantity, responsiveness, or quality of the output required by the customer or the organization.

Performance Measures. Indicators of the work performed and the results achieved in an activity, Process, or organizational unit. Performance measures may be financial or nonfinancial. An example Of a performance measure of an activity is the number of defective parts per million. An example of a performance measure of an organizational unit is return on sales.

Unit Cost. The cost associated with a single unit of the product, including direct costs, indirect costs, traced costs, and allocated costs.

Value-added Activity. An activity that is judged to contribute to customer value or satisfy an organizational need. The attribute "value-added" reflects a belief that the activity cannot be eliminated without reducing the quantity, responsiveness, or quality of output required by a customer or organization.

REFERENCES

The material used for this guide was taken from the following sources:

- Using Activity Based Management For Continuous Improvement (Step by Step Approach), Published by ICMS, Inc.
- Pryor Convictions – 31 Insights Into ABM, Tom Pryor
- The ABC Manager's Primer, Gary Cokins, EDS, Alan Stratton, CMA, National Semiconductor, and Jack Helbling, Proctor & Gamble
- Implementing Activity-Based Management In Daily Operations, John A. Miller
- SAS ABC Training Manuals